ENERGY EFFICIENCY AND TECHNOLOGY

KEY PROPOSITIONS

The **Energy Options** seminar on Energy Efficiency and Technology held in Winnipeg, October 4-6, 1987, addressed the following questions:

- How can energy technology contribute to improvements in end use and supply efficiencies, a sustainable environment, and a competitive economy?
- What are the constraints?
- How should Canadians manage the technological means of expanding our energy options?

Discussions at the first **Energy Options** conference, held in Calgary in June led to the assertion that efficient energy development and use should be pursued as a guiding principle of Canada's energy policy. In Winnipeg, participants confirmed this assertion, and that the concept of **efficiency** should be a broad one, in which energy is considered as one input among many, to be optimized in an effort to achieve broad **economic efficiency**.

From the discussions and background papers presented at the seminar, it was apparent that pursuit of this concept of energy efficiency would promote some important higher-order goals relevant to Canada's energy future:

- efficient production and use of energy will contribute to a flexible and secure energy supply for Canada;
- efficient production and use of energy will enhance and support a sustainable environment (or the concept of "sustainable development");
- efficient use of energy, in particular, will improve the competitiveness of Canada's economy.

Participants in the Winnipeg session, as in other **Energy Options** seminars, endorsed the notion that the marketplace should be encouraged to function as an efficient resource allocator for energy (and for other commodities).

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I The Role of Technology

It was recognized that technology can provide a diverse range of energy options, and that improved technologies, both for the supply and use of energy, can contribute to environmental quality and to the competitiveness of Canada's economy. There was very strong support for the pursuit of efficiency through the adoption of available energy end use technologies, and a recognition that improved technologies need to be developed, particularly on the supply side (though not exclusively).

Such multiple objectives imply a set of trade-offs and limits, as well as investment opportunities and management requirements. It is hoped that questions and propositions like the following will be examined and clarified in the debate in Montreal:

- Can technology be employed to enhance the environment and improve industrial competitiveness at the same time? Who should pay the costs?

- What are the economic limits of energy diversification? What premium beyond market price, if any, should be put on developing alternative energy technologies?

- How should industry, or government, set priorities among technologies? What balance of investment and support should be struck between supply and demand technologies?

II Energy Demand

Work on end use efficiency is every bit as important as work on new supply, and should have at least the same level of resources behind it.

- Evidence presented by industrial users and other analysts in Winnipeg indicated that implementation of known technology can make a major contribution to improved efficiency. But "energy efficiency" is not always synonymous with "economic efficiency".

- The key constraints to greater market penetration of such technologies are not primarily technological in nature, but rather include a multiplicity of market and non-market or institutional barriers, arising from the novelty of some technologies, inefficient energy pricing or lack of metering systems, regulatory and interjurisdictional barriers, domestic energy users who rent and thus are not encouraged to invest in energy efficiency, advanced efficiency systems which require industrial process change, sunk capital costs which overshadow energy savings from new investment, etc.

- Part of the answer may lie in paying more attention to the management of technology development and of technology adoption, both at the company level and in public policy.

III Energy Supply

Canada needs to continue to develop a broad range of energy supply technologies, in order to be able to enjoy the advantages of "multiple energy choice" in an uncertain price environment.

- The barriers to exploiting Canada's advantage in energy resources stem largely from problems of technological development and associated costs.

- Canada's approach should be to identify and exploit market "niches" for technologies based on indigenous resource supply and specialized skills and needs (e.g., improved extraction and upgrading of bitumen, enhanced oil recovery, frontier oil, clean combustion of coal, pipelining of coal, Fundy tidal power, potential for liquid fuels from biological processes, and the implications of the greenhouse effect)

- Canada should participate in international cooperative programs to maintain access to developments across the broader spectrum.

IV Role of Government

Although the Winnipeg seminar emphasized that markets should be the final arbiter of the application of energy efficient technologies, it was generally agreed that owing to the importance of efficiency in the supply and use of energy, and its linkages with such important considerations as industrial strategy, regional development and interprovincial trade, there is a strategic role for government.

The role for government should be subservient to market decisions and government should intervene only:

- to correct market imperfections or distortions, such as a tendencey to discount the long term and to reject projects that may be fundamentally economic but are not financially attractive;

- to identify institutional barriers to the adoption of market-ready technologies; and

- to promote in market sensitive ways, the development and use of efficient energy supply and end-use technologies.

This proposition obligates us to consider the relative roles of markets and governments in the development and adoption of energy efficient technologies.

It also requires us to examine whether there are institutional or consultative means by which governments can act in concert with the private sector to achieve energy efficiency objectives (examples: the Alberta Oil Sands Technology and Research Authority (AOSTRA) model, and support for "pre-competitive" research and development and for industrial task forces interested in energy efficiency).